Remarks

Election/Restriction

Applicants have petitioned the Group Director to review the restriction requirement set forth in the Office Action mailed on October 4, 2004, as maintained in the Office Action mailed May 23, 2005. The petition was sent via facsimile on October 17, 2005.

Rejection Under 35 U.S.C. § 112, first paragraph, enablement

Claims 1-4, 6 and 7 were rejected under 35 U.S.C. § 112, first paragraph, as not being enabled, for sequences other than those present in the contiguous sequence of human CD45. Applicants respectfully traverse this rejection to the extent that it is applied to the claims as amended. Claims 1 and 7 have been canceled to facilitate prosecution. Therefore, all rejections of claims 1 and 7 are now moot. The remaining claims have been amended to limit the claims to a single peptide or a variant thereof. This amendment is not to be construed as an admission that the claims are not enabled or patentable for their full scope. Claim 42 has been added to define the peptide as FLYDVIAST (SEQ ID NO:1). Support for new claim 42 can be found in the specification at least at page 5, lines 10-11.

Claim 2 has been amended into independent format to define a peptide containing 9 to 12 amino acid residues, wherein the peptide contains an HLA-binding peptide of the human CD45 polypeptide containing the amino acid sequence FLYDVIAST (SEQ ID NO:1) or a variant of SEQ ID NO:1, wherein the variant contains one or two amino acid substitutions at position 2 and/or position 9. Support for this amendment can be found in the specification at least at page 7, line 21, page 3, lines 24-25, page 4, lines 26-27 and page 6, lines 17-20 and line 28. Claim 2,

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as amended, is enabled by the specification. The amino acid sequence of CD45 is disclosed in the specification at least at page 4, lines 22-24. Peptides of CD45 are disclosed in the specification at least at page 3, lines 24-26, page 4, lines 15-20 and page 5, lines 6-8. The preferred lengths of peptides are disclosed in the specification at least at page 8, lines 24-25. Methods for generating peptides are disclosed in the specification at least at the paragraph spanning page 9 and 10. Variants of peptides and methods for producing variants are disclosed in the paragraph spanning page 6 and 7. Peptides capable of binding to HLA-A0201, as defined by claim 3, are disclosed in the specification at least at Example 1. Peptide-bound HLA-A0201 capable of eliciting the production of a cytotoxic T lymphocyte (CTL), as defined in claim 4, is disclosed in the specification at least at page 8, lines 16-22, page 16, lines 25-28, page 17, lines 1-4. Methods for producing such CTL are disclosed in the specification at least at the paragraph spanning page 17 and 18, and at pages 18-21. It is clear from the guidance provided in the specification that it would not require undue experimentation to generate the peptides as defined by claims 2-4, 6 and 42, as amended.

Rejection Under 35 U.S.C. § 112, first paragraph, written description

Claims 1-4, 6 and 7 were rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the art that the inventor had possession of the claimed invention. Applicants respectfully traverse this rejection to the extent that it is applied to the claims as amended.

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The Examiner has rejected the claims for lack of written description because allegedly the claims encompass amino acid sequences not present in the contiguous sequence of human CD45. Claim 2, as amended, defines a peptide containing 9 to 12 amino acid residues, wherein the peptide contains an HLA-binding peptide of the human CD45 polypeptide containing the amino acid sequence FLYDVIAST (SEQ ID NO:1) or a variant of SEQ ID NO:1, wherein the variant contains one or two amino acid substitutions at position 2 and/or position 9. As discussed above, the amino acid sequence of CD45 is disclosed in the specification at least at page 4, lines 22-24. Peptides of CD45 are disclosed in the specification at least at page 3, lines 24-26, page 4, lines 15-20 and page 5, lines 6-8. The preferred lengths of peptides are disclosed in the specification at least at page 8, lines 24-25. Methods for generating peptides are disclosed in the specification at least at the paragraph spanning page 9 and 10. Variants of peptides and methods for producing variants are disclosed in the paragraph spanning page 6 and 7. Therefore, the claims, as amended, are described in such a way as to reasonably convey to one skilled in the art that the inventor had possession of the peptide as defined by the claims of the present application.

Rejection Under 35 U.S.C. § 112, second paragraph

Claims 1, 4 and 7 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Applicants respectfully traverse this rejection to the extent that it is applied to the claims as amended.

The Examiner has rejected claim 4 for allegedly being indefinite for recitation of the phrase "a polypeptide expressing the given amino acid sequence." Claim 4, as amended, recites

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"a polypeptide comprising the HLA-binding peptide of human CD45 polypeptide." Support for this amendment can be found in the specification at least at page 16, lines 25-27 and page 22, lines 6-9. Claim 4, as amended, is definite.

Rejection Under 35 U.S.C. § 102

Claims 1-3 and 6 were rejected under 35 U.S.C. § 102(b) as being anticipated by (1) UniProt Accession No. Q29311 (1996) ("Q29311") as evidenced by The Leukocyte Antigen Fact Book 2nd ed., pp. 244-247, Academic Press (1997) ("Leukocyte") and alleged admissions in the specification at Example 1 and Figure 1; (2) International Application WO 92/13887 by Humphries ("Humphries") as evidenced by Leukocyte and alleged admissions in the specification at Example 1 and Figure 1; and (3) UniProt Accession No. P06800 (1988) ("P06800") as evidenced by Leukocyte and alleged admissions in the specification at Example 1 and Figure 1. Claims 1-3 and 6 were rejected under 35 U.S.C. § 102(e) as being anticipated by U. S. Patent No. 6,060,054 to Staerz ("Staerz") as evidenced by Leukocyte and alleged admissions in the specification at Example 1 and Figure 1. Claims 1-3 and 6 were rejected under 35 U.S.C. § 102(a) as being anticipated by Staerz as evidenced by Leukocyte and alleged admissions in the specification at Example 1 and Figure 1. Applicants respectfully traverse these rejections to the extent that it is applied to the claims as amended. Claim 1 has been canceled. Therefore, all rejections of claim 1 are now moot.

None of the references cited by the Examiner anticipate the claims of the present application.

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The Legal Standard

For a rejection of claims to be properly founded under 35 U.S.C. § 102, it must be established that a prior art reference discloses each and every element of the claims. *Hybritech Inc v Monoclonal Antibodies Inc*, 231 USPQ 81 (Fed. Cir. 1986), *cert. denied*, 480 US 947 (1987); *Scripps Clinic & Research Found v Genentech Inc*, 18 USPQ2d 1001 (Fed. Cir. 1991). The Federal Circuit held in *Scripps*, 18 USPQ2d at 1010:

> **Invalidity for anticipation requires that all of the elements and limitations of the claim are found within a single prior art reference.** *There must be no difference* between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field of the invention. (Emphasis added)

A reference that fails to disclose even one limitation will not be found to anticipate, even if the missing limitation could be discoverable through further experimentation. As the Federal Circuit held in *Scripps, Id.*:

> [A] finding of anticipation requires that all aspects of the claimed invention were already described in a single reference: a finding that is not supportable if it is necessary to prove facts beyond those disclosed in the reference in order to meet the claim limitations. The role of extrinsic evidence is to educate the decision-maker to what the reference meant to persons of ordinary skill in the field of the invention, not to fill in the gaps in the reference.

For a prior art reference to anticipate a claim, it must enable a person skilled in the art to make and use the invention. "A claimed invention cannot be anticipated by a prior art reference

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if the allegedly anticipatory disclosures cited as prior art are not enabled". *Amgen, Inc. v. Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1354, 65 USPQ2d 1385, 1416 (Fed. Cir. 2003). The References cited by the Examiner do not anticipate each and every element of the claims.

The Prior Art

Q29311

Q29311 discloses a 74 amino acid fragment of porcine leukocyte common antigen (CD45).

Leukocyte

Leukocyte discloses the amino acid sequence of human CD45.

Humphries

Humphries discloses peptides for regulating or controlling cell adhesion. Humphries discloses that a fragment of CD45 can bind to MOLT-4 cells (human lymphoblastic leukemia cells) and that a fragment of CD45 can cause cell spreading of A375-SM cells (human metastatic melanoma cells).

P06800

P06800 discloses a portion of murine CD45.

Staerz

Staerz discloses products and processes for suppressing an immune response using a T-lymphocyte immunosuppression molecule. Staerz discloses CD45, having 553 amino acids.

The Examiner does not cite a single prior art reference that discloses each and every element of the claims. As noted above, a claim is anticipated only if each and every element as

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set forth in the claim is found, either expressly or inherently described, **in a single prior art reference**." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The Examiner has rejected the claims over combinations of references and in conjunction with the disclosure of the present application, which is not permissible. Therefore, the claims are not anticipated because the claims are not described in a single prior art reference.

In addition, none of the cited references, alone or in combination, disclose or suggest a peptide of 9 to 12 amino acid residues, wherein the peptide contains an HLA-binding peptide present in the 533 amino acid sequence of human CD45. None of the references, alone or in combination, disclose or suggest a peptide of 9 to 12 amino acid residues containing the amino acid sequence FLYDVIAST (SEQ ID NO:1) or a variant of SEQ ID NO:1. None of the cited references disclose or suggest which peptides present in the 533 amino acid sequence of human CD45 bind HLA molecules. Therefore, the cited references do not disclose or suggest each and every element of the claims. Therefore, claims 2, 3 and 6 are not anticipated by Q29311, Leukocyte, Humphries, P06800 and Staerz.

Rejection Under 35 U.S.C. § 103

Claims 1-4 and 6 were rejected under 35 U.S.C. § 103(a) as obvious over (1) International Application WO 97/26328 by RPMS Technology Limited ("WO 97/26328"), in combination with Leukocyte and Rammensee, et al., MHC Ligands and Peptide Motifs, pp 217-227 and 236-281, LANDES Bioscience (1997) ("Rammensee") and (2) WO 97/26328 in combination with Leukocyte and U.S. Patent No. 6,602,510 to Fikes, et al., ("Fikes"). Claim 7

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was rejected under 35 U.S.C. § 103(a) as obvious over (1) WO 97/26328 in combination with Leukocyte and Rammensee and further in combination with Mottez, et al., *J. Exp. Med.* 181:493-502 (1995) ("Mottez") and (2) WO 97/26328 in combination with Leukocyte and Fikes and further in combination with Mottez. Applicants respectfully traverse this rejection to the extent that it is applied to the claims as amended.

The Legal Standard

The U.S. Patent and Trademark Office has the burden under 35 U.S.C. § 103 to establish a *prima facie* case of obviousness. *In re Warner et al.*, 379 F.2d 1011, 154 U.S.P.Q. 173, 177 (C.C.P.A. 1967); *In re Fine,* 837 F.2d 1071, 1074, 5 U.S.P.Q.2d 1596, 1598-99 (Fed. Cir. 1988). **To establish a *prima facie* case of obviousness, three basic criteria must be met.** First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *In re Vaeck,* 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

The prior art must provide one of ordinary skill in the art with the motivation to make the proposed modifications needed to arrive at the claimed invention. *In re Geiger,* 815 F.2d 686, 2 U.S.P.Q.2d 1276 (Fed. Cir. 1987); *In re Lalu and Foulletier,* 747 F.2d 703, 705, 223 U.S.P.Q. 1257, 1258 (Fed. Cir. 1984). Claims for an invention are not *prima facie* obvious if the primary

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references do not suggest all elements of the claimed invention and the prior art does not suggest the modifications that would bring the primary references into conformity with the application claims. *In re Fritch*, 23 U.S.P.Q.2d, 1780 (Fed. Cir. 1992); *In re Laskowski*, 871 F.2d 115 (Fed. Cir. 1989). This is not possible when the claimed invention achieves more than what any or all of the prior art references allegedly suggest, expressly or by reasonable implication.

It is clear that to establish a rejection under 35 U.S.C. § 103 the cited references must (1) recite each element of the claims, (2) provide one of skill in the art with the motivation to combine the cited references as applicants have done and (3) provide one of ordinary skill in the art with a reasonable expectation of success. The references cited by the Examiner clearly do not meet all three criteria.

The Prior Art

WO 97/26328

WO 97/26328 discloses a method for generating cytotoxic T lymphocytes (CTL) against selected peptides presented by a patient's HLA class I molecules. WO 97/26328 states that the peptides must be presented abnormally or must be elevated in diseased cells.

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Rammensee

Rammensee discloses residue motifs for peptides that bind to individual class I HLA molecules.

Leukocyte

Leukocyte discloses the amino acid sequence of human CD45.

Fikes

Fikes discloses peptide epitopes that can be used to monitor an immune response to a tumor associated antigen or to create a cancer vaccine.

(1) The cited references must recite each and every element of the claims.

None of these references, alone or in combination, disclose or suggest a peptide of 9 to 12 amino acid residues, wherein the peptide contains the amino acid sequence FLYDVIAST (SEQ ID NO:1) or a variant of SEQ ID NO:1. Therefore, the claims of the present application are not obvious in view of the cited references.

(2) Provide one of skill in the art with the motivation to combine the cited references as applicants have done.

None of these references provide one of ordinary skill in the art with the motivation to combine these references. None of the references suggest deriving peptides of CD45. WO 97/26328 discloses at pages 7-8 a large list of disease-associated proteins that are suitable targets for tumor immunotherapy. This list does not include CD45. Leukocyte does not disclose or suggest generating peptides of CD45 for immunotherapy. Therefore, one of ordinary skill in that art would not be motivated to combine WO 97/26328 and Leukocyte to identify epitopes of

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CD45 for immunotherapy. Furthermore, one of ordinary skill in the art would not be motivated to use CD45 as disclosed in Leukocyte in the method disclosed in WO 97/26328 because CD45 is expressed in haematopoietic malignancies at similar levels as normal cells (see at least page 2, lines 18-19 of the present application) and WO 97/26328 discloses that the antigen for the CTL is expressed abnormally. Since one of ordinary skill in the art would not combine WO 97/26328 and Leukocyte, they would not combine these references further with Rammensee or Fikes. Therefore, the claims are not obvious over the cited references.

(3) Provide one of ordinary skill in the art with a reasonable expectation of success

The cited references clearly do not provide one of ordinary skill in the art with a reasonable expectation of success. In addition, the Examiner has not established a *prima facie* case of obviousness, because the Examiner has not cited a single place in WO 07/26328, Leukocyte, Rammensee, or Fikes that provides one of ordinary skill in the art with a reasonable expectation of success.

As discussed above, one of ordinary skill in the art would not expect the CD45 of Leukocyte to work in the method of WO 97/26328 because as described in the present application CD45 is expressed in haematopoietic malignancies at similar levels as normal cells. Rammensee discusses principles that were allegedly useful to predict peptides that bind MHC molecules. However, binding **predictions** do not always predict actual binding affinity. There is no way of knowing based on Rammensee whether any CD45 peptides generated through their method would **actually** bind an HLA molecule. The principles disclosed in Rammensee are provided on the internet at

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http://www.syfpeithi.de/Scripts/MHCServer.dll/EpitopePrediction.htm. Applicants inserted the human sequence of CD45 into the program and searched for peptides of 10 residues in length that bind HLA-0201. The results, a copy of which is enclosed, is a list of **hundreds** of peptides. There is no guidance as to which peptides would actually bind MHC molecules. Without additional guidance, one of skill in the art would have to test each of the peptides to determine which peptides actually bind MHC molecules. In contrast to the unknown properties of Rammensee, Applicants have demonstrated the binding affinity of CD45 peptides (see at least Figure 1 and Example 1).

Rammensee does not provide a reasonable expectation of success for peptides with binding affinity that are also immunogenic (i.e., able to stimulate a CTL response). Based on Rammensee there is no way of knowing whether any of the peptides predicted by Rammensee actually bind the HLA molecule and can stimulate a CTL response. Again in contrast to the cited references, the Applicants have demonstrated immunogenicity of CD45 peptides using allogeneic CTL (see at least Figure 2 and Example 2). This was not predicted but determined experimentally. The cited references also do not provide a reasonable expectation of success for peptides that stimulate CTL to kill tumor cells expressing CD45. Based on the cited references there is no way of knowing which peptides bind the HLA molecule and which actually stimulate a CTL response that would be effective in killing tumor cells that express CD45. Yet again, in contrast to the lack of guidance provided in the cited references, the Applicants have demonstrated that isolated CTLs stimulated by CD45 peptides can kill CD45 expressing tumor cells (see at least Figures 4 and 5). With respect to Fikes, Fikes discloses epitopes of a target

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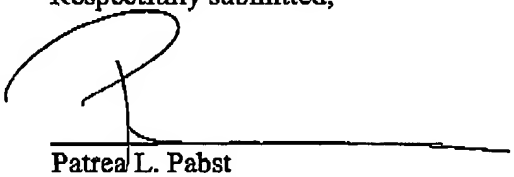
antigen that is **not** CD45 that have been identified and validated. Fikes does not disclose or suggest predicting epitopes from other polypeptides. However, even if a skilled person was able to derive a method for predicting peptides from Fikes, Fikes does not provide a reasonable expectation of success regarding which peptides of CD45 have actual binding affinity or which peptides would be effective in stimulating CTLs and kill tumor cells expressing CD45. Therefore, the cited references do not provide one of ordinary skill in the art with a reasonable expectation of success for peptides of CD45. From the forgoing discussion, it is clear that the claims, as amended, are not obvious over the cited art.

Allowance of claims 2-6, and 8-42 is respectfully solicited.

Respectfully submitted,



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Epitope prediction

This page allows you to find out the ligation strength to a defined HLA type for a sequence of aminoacids. The algorithmus used are based on the book "MHC Ligands and Peptide Motifs" by H.G.Rammensee, J.Bachmann and S.Stevanovic. The probability of being processed and presented is given in order to predict T-cell epitopes.

1. Select MHC type

- all
- H2-Ak
- H2-Db
- H2-Ek
- H2-Kb

Hold down ctrl key when clicking to select multiple items

2. Choose a mer

- octamers (8 aa)
- nonamers (9 aa)
- decamers (10 aa)
- 15 - mers (15 aa) for MHC Type II only
- all mers

3. Paste your sequence here:

```
mylwlkllaf gfafldtevf vtgqsptpsp
tglttakmps vplssdplpt httafspast
ferendfset ttslspdnts tqvspdsldn
asafnttgvs svqtphlpth adsqtpsagt
```

You may use SYFPEITHI with H2-Kd to see an example

4. Choose Run to start analysis

Run Reset Home

Search Report

Return to search conditions
HLA-A*0201 decamers

HLA-A*0201 decamers go to top

Pos	1 2 3 4 5 6 7 8 9 0	score
456	S L H A Y I I A K V	30
584	L I I V T S I A L L	28
169	S L A H H S S A A L	27
438	N L I K Y D L Q N L	26
635	I L L E T Y K R K I	26
6	K L L A F G F A F L	25
195	Y L N A S E T T T L	25
270	N L T E C K N A S V	25
1175	G I F C A L L N L L	25
292	T L I L D V P P G V	24
583	F L I I V T S I A L	24
736	R M I W E Q K A T V	24
1137	S M I Q V V K Q K L	24
32	G L T T A K M P S V	23
575	K A L I A F L A F L	23
590	I A L L V V L Y K I	23
643	K I A D E G R L F L	23
772	R A F G D V V V K I	23
1020	F I M S Y W K P E V	23
1046	Q M I F Q R K V K V	23
1095	S T Y T L R V F E L	23
1183	L L E S A E T E E V	23
203	T L S P S G S A V I	22
345	M I F D N K E I K L	22
446	N L K P Y T K Y V L	22
517	H L E V E A G N T L	22
576	A L I A F L A F L I	22
683	D I L P Y D Y N R V	22
827	H L L L K L R R R V	22
870	G L E A E N K V D V	22
885	K L R R Q R C L M V	22

901	I L I H Q A L V E Y	22
1201	A L R K A R P G M V	22
211	V I S T T T I A T T	21
424	Y I K E T E K D C L	21
578	I A F L A F L I I V	21
581	L A F L I I V T S I	21
585	I I V T S I A L L V	21
587	V T S I A L L V V L	21
593	L V V L Y K I Y D L	21
649	R L F L A E F Q S I	21
1180	L L N L L E S A E T	21
1291	S V N G P A S P A L	21
187	I T A N T S D A Y L	20
577	L I A F L A F L I I	20
580	F L A F L I I V T S	20
586	I V T S I A L L V V	20
722	A A Q G P R D E T V	20
862	I G I D A M L E G L	20
1047	M I F Q R K V K V I	20
1244	I E F D N E V D K V	20
2	Y L W L K L L A F G	19
93	A F N T T G V S S V	19
177	A L P A R T S N T T	19
286	C T A P D K T L I L	19
448	K P Y T K Y V L S L	19
492	S M T S D N S M H V	19
601	D L H K K R S C N L	19
652	L A E F Q S I P R V	19
737	M I W E Q K A T V I	19
974	N V I P Y D Y N R V	19
1079	Q T Y G D I E V D L	19
1186	S A E T E E V V D I	19
1225	S T Y P A Q N G Q V	19
12	F A F L D T E V F V	18
34	T T A K M P S V P L	18
133	K L N P T P G S N A	18
572	Y N S K A L I A F L	18
685	L P Y D Y N R V E L	18
803	K A T G R E V T H I	18
821	G V P E D P H L L L	18
846	P I V V H C S A G V	18

859	G T Y I G I D A M L	18
866	A M L E G L E A E N	18
877	V D V Y G Y V V K L	18
892	L M V Q V E A Q Y I	18
914	G E T E V N L S E L	18
1032	A A Q G P L K E T I	18
1127	Q L P A E P K E L I	18
1135	L I S M I Q V V K Q	18
128	S A A N A K L N P T	17
202	T T L S P S G S A V	17
229	K Y A N I T V D Y L	17
244	K L F T A K L N V N	17
288	A P D K T L I L D V	17
453	Y V L S L H A Y I I	17
589	S I A L L V V L Y K	17
625	L M N V E P I H A D	17
770	G T R A F G D V V V	17
786	R C P D Y I I Q K L	17
829	L L K L R R R V N A	17
1015	Y I N A S F I M S Y	17
1031	I A A Q G P L K E T	17
1053	V K V I V M L T E L	17
1133	K E L I S M I Q V V	17
1192	V V D I F Q V V K A	17
1263	L G A P E K L P E A	17
73	S L S P D N T S T Q	16
87	S L D N A S A F N T	16
98	G V S S V Q T P E L	16
167	T L S L A H H S S A	16
249	K L N V N E N V E C	16
294	I L D V P P G V E K	16
376	F T N A S K I I K T	16
480	S A P P S Q V W N M	16
511	G P H E R Y H L E V	16
619	R D D E K Q L M N V	16
630	P I H A D I L L E T	16
644	I A D E G R L F L A	16
705	Y I N A S Y I D G F	16
789	D Y I I Q K L N I V	16
791	I I Q K L N I V N K	16
823	P E D P H L L L X L	16

940	S F L E A E F Q R L	16
976	I P Y D Y N R V P L	16
1090	D T D K S S T Y T L	16
1163	L L I H C R D G S Q	16
1174	T G I F C A L L N L	16
1178	C A L L N L L E S A	16
1182	N L L E S A E T E E	16
1193	V D I F Q V V K A L	16
1254	K Q D A N C V N P L	16
1283	S G T E G P E H S V	16
14	F L D T E V F V T G	15
37	K M P S V P L S S D	15
90	N A S A F N T T G V	15
125	F S G S A A N A K L	15
259	G N N T C T N N E V	15
305	Q L H D C T Q V E K	15
320	C L K W K N I E T F	15
369	I L Y N N H K F T N	15
454	V L S L H A Y I I A	15
472	A M C H F T T K S A	15
533	K N C D F R V K D L	15
569	S T S Y N S K A L I	15
607	S C N L D E Q Q E L	15
624	Q L M N V E P I E A	15
627	N V E P I H A D I L	15
651	F L A E F Q S I P R	15
868	L E G L E A E N K V	15
893	M V Q V E A Q Y I L	15
906	A L V E Y N Q F G E	15
911	N Q F G E T E V N L	15
980	Y N R V P L K H E L	15
1050	Q R K V K V I V M L	15
1087	D L K D T D K S S T	15
1116	Y Q Y Q Y T N W S V	15
1179	A L L N L L E S A E	15
1213	F E Q Y Q F L Y D V	15
1218	F L Y D V I A S T Y	15
8	L A F G F A F L D T	14
10	F G F A F L D T E V	14
42	P L S S D P L P T H	14
82	Q V S P D S L D N A	14

106	H L P T H A D S Q T	14
137	T P G S N A I S D V	14
152	T A S T F P T D P V	14
155	T F P T D P V S P L	14
161	V S P L T T T L S L	14
176	A A L P A R T S N T	14
178	L P A R T S N T T I	14
205	S P S G S A V I S T	14
241	K E T K L F T A K L	14
246	F T A K L N V N E N	14
262	T C T N N E V H N L	14
348	D N K E I K L E N L	14
356	N L E P E H E Y K C	14
394	Q I I F C R S E A A	14
395	I I F C R S E A A H	14
416	S F H N F T L C Y I	14
461	I I A K V Q R N G S	14
518	L E V E A G N T L V	14
557	G D Y P G E P F I L	14
616	L V E R D D E K Q L	14
636	L L E T Y K R K I A	14
688	D Y N R V E L S E I	14
721	I A A Q G P R D E T	14
828	L L L K L R R R V N	14
883	V V K L R R Q R C L	14
898	A Q Y I L I H Q A L	14
899	Q Y I L I H Q A L V	14
902	L I H Q A L V E Y N	14
918	V N L S E L H P Y L	14
948	R L P S Y R S W R T	14
1048	I F Q R K V K V I V	14
1098	T L R V F E L R H S	14
1130	A E P K E L I S M I	14
1268	K L P E A K E Q A E	14
4	W L K L L A F G F A	13
7	L L A F G F A F L D	13
13	A F L D T E V F V T	13
65	N D F S E T T T S L	13
74	L S P D N T S T Q V	13
101	S V Q T P H L P T H	13
154	S T F P T D P V S P	13

208	G S A V I S T T T I	13
210	A V I S T T T I A T	13
216	T I A T T P S K P T	13
239	Y N K E T K L F T A	13
247	T A K L N V N E N V	13
293	L I L D V P P G V E	13
297	V P P G V E K F Q L	13
317	T T I C L K W K N I	13
381	K I I K T D F G S P	13
398	C R S E A A H Q G V	13
426	K E T E K D C L N L	13
434	N L D K N L I K Y D	13
477	T T K S A P P S Q V	13
485	Q V W N M T V S M T	13
509	R N G P H E R Y H L	13
525	T L V R N E S H K N	13
565	I L H H S T S Y N S	13
591	A L L V V L Y K I Y	13
595	V L Y K I Y D L H K	13
608	C N L D E Q Q E L V	13
609	N L D E Q Q E L V E	13
676	Q N K N R Y V D I L	13
710	Y I D G F K E P R K	13
738	I W E Q K A T V I V	13
766	S M E E G T R A F G	13
794	K L N I V N K K E K	13
820	H G V P E D P H L L	13
831	K L R R R V N A F S	13
861	Y I G I D A M L E G	13
891	C L M V Q V E A Q Y	13
900	Y I L I H Q A L V E	13
919	N L S E L H P Y L H	13
921	S E L H P Y L H N M	13
1021	I M S Y W K P E V M	13
1030	M I A A Q G P L K E	13
1039	E T I G D F W Q M I	13
1044	F W Q M I F Q R K V	13
1057	V M L T E L K H G D	13
1077	G K Q T Y G D I E V	13
1119	Q Y T N W S V E Q L	13
1145	K L P Q K N S S E G	13

1171	S Q Q T G I F C A L	13
1172	Q Q T G I F C A L L	13
1189	T E E V V D I F Q V	13
1200	K A L R K A R P G M	13
1204	K A R P G M V S T F	13
1217	Q F L Y D V I A S T	13
1222	V I A S T Y P A Q N	13
1260	V N P L G A P E K L	13
27	T P S P T G L T T A	12
134	L N P T P G S N A I	12
162	S P L T T T L S L A	12
224	P T C D E K Y A N I	12
232	N I T V D Y L Y N K	12
236	D Y L Y N K E T K L	12
237	Y L Y N K E T K L F	12
243	T K L F T A K L N V	12
272	T E C K N A S V S I	12
291	K T L I L D V P P G	12
306	L H D C T Q V E K A	12
310	T Q V E K A D T T I	12
432	C L N L D K N L I K	12
435	L D K N L I K Y D L	12
443	D L Q N L K P Y T K	12
460	Y I I A K V Q R N G	12
464	K V Q R N G S A A M	12
579	A F L A F L I I V T	12
592	L L V V L Y K I Y D	12
626	M N V E P I H A D I	12
697	I N G D A G S N Y I	12
720	Y I A A Q G P R D E	12
740	E Q K A T V I V M V	12
790	Y I I Q K L N I V N	12
796	N I V N K K E K A T	12
800	K K E K A T G R E V	12
839	F S N F F S G P I V	12
840	S N F F S G P I V V	12
853	A G V G R T G T Y I	12
875	N K V D V Y G Y V V	12
887	R R Q R C L M V Q V	12
926	Y L H N M K K R D P	12
933	R D P P S E P S P L	12

1028	E V M I A A Q G P L	12
1029	V M I A A Q G P L K	12
1055	V I V M L T E L K H	12
1060	T E L K H G D Q E I	12
1082	G D I E V D L K D T	12
1126	E Q L P A E P K E L	12
1129	P A E P K E L I S M	12
1184	L E S A E T E E V V	12
1235	K K N N H Q E D K I	12
24	Q S P T P S P T G L	11
29	S P T G L T T A K M	11
44	S S D P L P T H T T	11
51	H T T A F S P A S T	11
79	T S T Q V S P D S L	11
92	S A F N T T G V S S	11
95	N T T G V S S V Q T	11
123	Q T F S G S A A N A	11
142	A I S D V P G E R S	11
146	V P G E R S T A S T	11
159	D P V S P L T T T L	11
164	L T T T L S L A H H	11
190	N T S D A Y L N A S	11
226	C D E K Y A N I T V	11
280	S I S H N S C T A P	11
284	N S C T A P D K T L	11
303	K F Q L H D C T Q V	11
336	I T Y R F Q C G N M	11
343	G N M I F D N K E I	11
361	H E Y K C D S E I L	11
387	F G S P G E P Q I I	11
421	T L C Y I K E T E K	11
433	L N L D K N L I K Y	11
445	Q N L K P Y T K Y V	11
452	K Y V L S L H A Y I	11
462	I A K V Q R N G S A	11
490	T V S M T S D N S M	11
498	S M H V K C R P P R	11
520	V E A G N T L V R N	11
541	D L Q Y S T D Y T F	11
564	F I L H H S T S Y N	11
615	E L V E R D D E K Q	11

628	V E P I H A D I L L	11
631	I H A D I L L E T Y	11
675	N Q N K N R Y V D I	11
684	I L P Y D Y N R V E	11
745	V I V M V T R C E E	11
797	I V N K K E K A T G	11
813	Q F T S W P D H G V	11
864	I D A M L E G L E A	11
867	M L E G L E A E N K	11
894	V Q V E A Q Y I L I	11
959	H I G N Q E E N K S	11
982	R V P L K H E L E M	11
1007	S D S E E P S K Y I	11
1022	M S Y W K P E V M I	11
1023	S Y W K P E V M I A	11
1058	M L T E L K H G D Q	11
1106	H S K R K D S R T V	11
1134	E L I S M I Q V V K	11
1155	N K H H K S T P L L	11
1167	C R D G S Q Q T G I	11
1196	F Q V V K A L R K A	11
84	S P D S L D N A S A	10
88	L D N A S A F N T T	10
96	T T G V S S V Q T P	10
109	T H A D S Q T P S A	10
129	A A N A K L N P T P	10
140	S N A I S D V P G E	10
144	S D V P G E R S T A	10
157	P T D P V S P L T T	10
158	T D P V S P L T T T	10
175	S A A L P A R T S N	10
185	T T I T A N T S D A	10
193	D A Y L N A S E T T	10
194	A Y L N A S E T T T	10
209	S A V I S T T T I A	10
233	I T V D Y L Y N K E	10
263	C T N N E V H N L T	10
278	S V S I S H N S C T	10
295	L D V P P G V E K F	10
309	C T Q V E K A D T T	10
312	V E K A D T T I C L	10

319	I C L K W K N I E T	10
327	E T F T C D T Q N I	10
353	K L E N L E P E E E	10
400	S E A A H Q G V I T	10
402	A A H Q G V I T W N	10
430	K D C L N L D K N L	10
431	D C L N L D K N L I	10
470	S A A M C H F T T K	10
484	S Q V W N M T V S M	10
516	Y H L E V E A G N T	10
598	K I Y D L H K K R S	10
641	K R K I A D E G R L	10
658	I P R V F S K F P I	10
661	V F S K F P I K E A	10
693	E L S E I N G D A G	10
729	E T V D D F W R M I	10
741	Q K A T V I V M V T	10
743	A T V I V M V T R C	10
747	V M V T R C E E G N	10
780	K I N Q H K R C P D	10
795	L N I V N K K E K A	10
816	S W P D H G V P E D	10
819	D H G V P E D P E L	10
830	L K L R R R V N A F	10
838	A F S N F F S G P I	10
855	V G R T G T Y I G I	10
871	L E A E N K V D V Y	10
907	L V E Y N Q F G E T	10
909	E Y N Q F G E T E V	10
922	E L H P Y L H N M K	10
929	N M K K R D P P S E	10
951	S Y R S W R T Q H I	10
966	N K S K N R N S N V	10
1056	I V M L T E L K H G	10
1092	D K S S T Y T L R V	10
1154	G N K H H K S T P L	10
1156	K H H K S T P L L I	10
1162	P L L I H C R D G S	10
1164	L I H C R D G S Q Q	10
1177	F C A L L N L L E S	10
1194	D I F Q V V K A L R	10

1203	R K A R P G M V S T	10
1251	D K V K Q D A N C V	10
1256	D A N C V N P L G A	10
1259	C V N P L G A P E K	10
39	P S V P L S S D P L	9
47	P L P T H T T A F S	9
59	S T F E R E N D F S	9
61	F E R E N D F S E T	9
111	A D S Q T P S A G T	9
166	T T L S L A H H S S	9
168	L S L A H H S S A A	9
181	R T S N T T I T A N	9
192	S D A Y L N A S E T	9
197	N A S E T T T L S P	9
201	T T T L S P S G S A	9
279	V S I S H N S C T A	9
285	S C T A P D K T L I	9
287	T A P D K T L I L D	9
300	G V E K F Q L H D C	9
318	T I C L K W K N I E	9
324	K N I E T F T C D T	9
325	N I E T F T C D T Q	9
344	N M I F D N K E I K	9
352	I K L E N L E P E H	9
368	E I L Y N N H K F T	9
382	I I K T D F G S P G	9
401	E A A H Q G V I T W	9
408	I T W N P P Q R S F	9
413	P Q R S F H N F T L	9
420	F T L C Y I K E T E	9
439	L I K Y D L Q N L K	9
442	Y D L Q N L K P Y T	9
450	Y T K Y V L S L H A	9
455	L S L H A Y I I A K	9
469	G S A A M C H F T T	9
471	A A M C H F T T K S	9
482	P P S Q V W N M T V	9
559	Y P G E P F I L H H	9
568	H S T S Y N S K A L	9
610	L D E Q Q E L V E R	9
622	E K Q L M N V E P I	9

657	S I P R V F S K F P	9
691	R V E L S E I N G D	9
699	G D A G S N Y I N A	9
700	D A G S N Y I N A S	9
702	G S N Y I N A S Y I	9
746	I V M V T R C E E G	9
842	F F S G P I V V H C	9
849	V H C S A G V G R T	9
851	C S A G V G R T G T	9
863	G I D A M L E G L E	9
865	D A M L E G L E A E	9
873	A E N K V D V Y G Y	9
878	D V Y G Y V V K L R	9
897	E A Q Y I L I H Q A	9
967	K S K N R N S N V I	9
1025	W K P E V M I A A Q	9
1040	T I G D F W Q M I F	9
1049	F Q R K V K V I V M	9
1075	G E G K Q T Y G D I	9
1097	Y T L R V F E L R H	9
1100	R V F E L R H S K R	9
1140	Q V V K Q K L P Q K	9
1170	G S Q Q T G I F C A	9
1208	G M V S T F E Q Y Q	9
1210	V S T F E Q Y Q F L	9
1211	S T F E Q Y Q F L Y	9
1241	E D K I E F D N E V	9
1243	K I E F D N E V D K	9
1	M Y L W L K L L A F	8
15	L D T E V F V T G Q	8
21	V T G Q S P T P S P	8
26	P T P S P T G L T T	8
35	T A K M P S V P L S	8
36	A K M P S V P L S S	8
41	V P L S S D P L P T	8
45	S D P L P T H T T A	8
63	R E N D F S E T T T	8
72	T S L S P D N T S T	8
121	D T Q T F S G S A A	8
141	N A I S D V P G E R	8
143	I S D V P G E R S T	8

151	S T A S T F P T D P	8
163	P L T T T L S L A H	8
170	L A H H S S A A L P	8
186	T I T A N T S D A Y	8
207	S G S A V I S T T T	8
215	T T I A T T P S K P	8
217	I A T T P S K P T C	8
230	Y A N I T V D Y L Y	8
234	T V D Y L Y N K E T	8
238	L Y N K E T K L F T	8
251	N V N E N V E C G N	8
314	K A D T T I C L K W	8
329	F T C D T Q N I T Y	8
337	T Y R F Q C G N M I	8
351	E I K L E N L E P E	8
363	Y K C D S E I L Y N	8
373	N H K F T N A S K I	8
374	H K F T N A S K I I	8
386	D F G S P G E P Q I	8
389	S P G E P Q I I F C	8
406	G V I T W N P P Q R	8
407	V I T W N P P Q R S	8
419	N F T L C Y I K E T	8
459	A Y I I A K V Q R N	8
537	F R V K D L Q Y S T	8
548	Y T F K A Y F H N G	8
556	N G D Y P G E P F I	8
571	S Y N S K A L I A F	8
582	A F L I I V T S I A	8
588	T S I A L L V V L Y	8
596	L Y K I Y D L H K K	8
634	D I L L E T Y K R K	8
638	E T Y K R K I A D E	8
673	P F N Q N K N R Y V	8
696	E I N G D A G S N Y	8
715	K E P R K Y I A A Q	8
739	W E Q K A T V I V M	8
742	K A T V I V M V T R	8
777	V V V K I N Q H K R	8
782	N Q H K R C P D Y I	8
783	Q H K R C P D Y I I	8

792	I Q K L N I V N K K	8
806	G R E V T H I Q F T	8
811	H I Q F T S W P D H	8
843	F S G P I V V H C S	8
844	S G P I V V H C S A	8
848	V V H C S A G V G R	8
852	S A G V G R T G T Y	8
857	R T G T Y I G I D A	8
889	Q R C L M V Q V E A	8
895	Q V E A Q Y I L I H	8
975	V I P Y D Y N R V P	8
984	P L K H E L E M S K	8
988	E L E M S K E S E H	8
1024	Y W K P E V M I A A	8
1036	P L K E T I G D F W	8
1051	R K V K V I V M L T	8
1062	L K H G D Q E I C A	8
1083	D I E V D L K D T D	8
1216	Y Q F L Y D V I A S	8
1227	Y P A Q N G Q V K K	8
1246	F D N E V D K V K Q	8
1262	P L G A P E K L P E	8
1264	G A P E K L P E A K	8
1294	G P A S P A L N Q G	8
9	A F G F A F L D T E	7
25	S P T P S P T G L T	7
40	S V P L S S D P L P	7
43	L S S D P L P T H T	7
52	T T A F S P A S T F	7
70	T T T S L S P D N T	7
71	T T S L S P D N T S	7
100	S S V Q T P H L P T	7
113	S Q T P S A G T D T	7
171	A H H S S A A L P A	7
180	A R T S N T T I T A	7
182	T S N T T I T A N T	7
206	P S G S A V I S T T	7
218	A T T P S K P T C D	7
225	T C D E K Y A N I T	7
255	N V E C G N N T C T	7
275	K N A S V S I S H N	7

321	L K W K N I E T F T	7
335	N I T Y R F Q C G N	7
340	F Q C G N M I F D N	7
367	S E I L Y N N H K F	7
370	L Y N N H K F T N A	7
377	T N A S K I I K T D	7
399	R S E A A H Q G V I	7
440	I K Y D L Q N L K P	7
451	T K Y V L S L H A Y	7
458	H A Y I I A K V Q R	7
463	A K V Q R N G S A A	7
476	F T T K S A P P S Q	7
479	K S A P P S Q V W N	7
481	A P P S Q V W N M T	7
488	N M T V S M T S D N	7
513	H E R Y H L E V E A	7
530	E S H K N C D F R V	7
540	K D L Q Y S T D Y T	7
545	S T D Y T F K A Y F	7
561	G E P F I L H H S T	7
604	K K R S C N L D E Q	7
633	A D I L L E T Y K R	7
646	D E G R L F L A E F	7
655	F Q S I P R V F S K	7
660	R V F S K F P I K E	7
663	S K F P I K E A R K	7
666	P I K E A R K P F N	7
692	V E L S E I N G D A	7
712	D G F K E P R K Y I	7
713	G F K E P R K Y I A	7
714	F K E P R K Y I A A	7
734	F W R M I W E Q K A	7
758	N K C A E Y W P S M	7
768	E E G T R A F G D V	7
771	T R A F G D V V V K	7
785	K R C P D Y I I Q K	7
788	P D Y I I Q K L N I	7
804	A T G R E V T H I Q	7
841	N F P S G P I V V H	7
858	T G T Y I G I D A M	7
876	K V D V Y G Y V V K	7

880	Y G Y V V. K L R R Q	7
884	V K L R R Q R C L M	7
890	R C L M V Q V E A Q	7
896	V E A Q Y I L I E Q	7
912	Q F G E T E V N L S	7
917	E V N L S E L H P Y	7
942	L E A E F Q R L P S	7
983	V P L K H E L E M S	7
1009	S E E P S K Y I N A	7
1013	S K Y I N A S F I M	7
1035	G P L K E T I G D F	7
1052	K V K V I V M L T E	7
1054	K V I V M L T E L K	7
1063	K E G D Q E I C A Q	7
1068	E I C A Q Y W G E G	7
1118	Y Q Y T N W S V E Q	7
1120	Y T N W S V E Q L P	7
1128	L P A E P K E L I S	7
1138	M I Q V V K Q K L P	7
1152	S E G N K H H K S T	7
1159	K S T P L L I H C R	7
1187	A E T E E V V D I F	7
1190	E E V V D I F Q V V	7
1220	Y D V I A S T Y P A	7
1221	D V I A S T Y P A Q	7
1257	A N C V N P L G A P	7
1275	Q A E G S E P T S G	7
1276	A E G S E P T S G T	7
18	E V F V T G Q S P T	6
20	F V T G Q S P T P S	6
23	G Q S P T P S P T G	6
54	A F S P A S T F E R	6
56	S P A S T F E R E N	6
80	S T Q V S P D S L D	6
102	V Q T P H L P T H A	6
103	Q T P H L P T H A D	6
114	Q T P S A G T D T Q	6
117	S A G T D T Q T F S	6
119	G T D T Q T F S G S	6
132	A K L N P T P G S N	6
145	D V P G E R S T A S	6

156	F P T D P V S P L T	6
172	H H S S A A L P A R	6
173	H S S A A L P A R T	6
174	S S A A L P A R T S	6
188	T A N T S D A Y L N	6
189	A N T S D A Y L N A	6
214	T T T I A T T P S K	6
250	L N V N E N V E C G	6
253	N E N V E C G N N T	6
261	N T C T N N E V H N	6
264	T N N E V H N L T E	6
283	H N S C T A P D K T	6
350	K E I K L E N L E P	6
354	L E N L E P E H E Y	6
364	K C D S E I L Y N N	6
384	K T D F G S P G E P	6
493	M T S D N S M H V K	6
495	S D N S M H V K C R	6
522	A G N T L V R N E S	6
524	N T L V R N E S H K	6
538	R V K D L Q Y S T D	6
543	Q Y S T D Y T F K A	6
554	F H N G D Y P G E P	6
567	H H S T S Y N S K A	6
570	T S Y N S K A L I A	6
574	S K A L I A F L A F	6
594	V V L Y K I Y D L H	6
617	V E R D D E K Q L M	6
656	Q S I P R V F S K F	6
670	A R K P F N Q N K N	6
679	N R Y V D I L P Y D	6
681	Y V D I L P Y D Y N	6
687	Y D Y N R V E L S E	6
695	S E I N G D A G S N	6
701	A G S N Y I N A S Y	6
725	G P R D E T V D D F	6
732	D D F W R M I W E Q	6
744	T V I V M V T R C E	6
749	V T R C E E G N R N	6
769	E G T R A F G D V V	6
773	A F G D V V V K I N	6

775	G D V V V K I N Q H	6
822	V P E D P H L L L K	6
837	N A F S N F F S G P	6
847	I V V H C S A G V G	6
854	G V G R T G T Y I G	6
856	G R T G T Y I G I D	6
874	E N K V D V Y G Y V	6
882	Y V V K L R R Q R C	6
886	L R R Q R C L M V Q	6
905	Q A L V E Y N Q F G	6
932	K R D P P S E P S P	6
935	P P S E P S P L E A	6
937	S E P S P L E A E F	6
941	P L E A E F Q R L P	6
943	E A E F Q R L P S Y	6
954	S W R T Q H I G N Q	6
956	R T Q H I G N Q E E	6
970	N R N S N V I P Y D	6
978	Y D Y N R V P L K H	6
985	L K H E L E M S K E	6
987	H E L E M S K E S E	6
990	E M S K E S E H D S	6
1042	G D F W Q M I F Q R	6
1061	E L K H G D Q E I C	6
1071	A Q Y W G E G K Q T	6
1103	E L R H S K R K D S	6
1113	R T V Y Q Y Q Y T N	6
1121	T N W S V E Q L P A	6
1122	N W S V E Q L P A E	6
1123	W S V E Q L P A E P	6
1132	P K E L I S M I Q V	6
1136	I S M I Q V V K Q K	6
1141	V V K Q K L P Q K N	6
1144	Q K L P Q K N S S E	6
1151	S S E G N K H H K S	6
1160	S T P L L I H C R D	6
1165	I H C R D G S Q Q T	6
1181	L N L L E S A E T E	6
1198	V V K A L R K A R P	6
1214	E Q Y Q F L Y D V I	6
1223	I A S T Y P A Q N G	6

1228	P A Q N G Q V K K N	6
1238	N H Q E D K I E F D	6
1281	P T S G T E G P E H	6
1284	G T E G P E H S V N	6
3	L W L K L L A F G F	5
5	L K L L A F G F A F	5
33	L T T A K M P S V P	5
49	P T H T T A F S P A	5
53	T A F S P A S T F E	5
68	S E T T T S L S P D	5
78	N T S T Q V S P D S	5
110	H A D S Q T P S A G	5
120	T D T Q T F S G S A	5
131	N A K L N P T P G S	5
136	P T P G S N A I S D	5
179	P A R T S N T T I T	5
184	N T T I T A N T S D	5
198	A S E T T T L S P S	5
213	S T T T I A T T P S	5
222	S K P T C D E K Y A	5
231	A N I T V D Y L Y N	5
248	A K L N V N E N V E	5
256	V E C G N N T C T N	5
265	N N E V H N L T E C	5
268	V H N L T E C K N A	5
271	L T E C K N A S V S	5
276	N A S V S I S H N S	5
277	A S V S I S H N S C	5
346	I F D N K E I K L E	5
347	F D N K E I K L E N	5
360	E H E Y K C D S E I	5
371	Y N N H K F T N A S	5
380	S K I I K T D F G S	5
393	P Q I I F C R S E A	5
422	L C Y I K E T E K D	5
427	E T E K D C L N L D	5
444	L Q N L K P Y T K Y	5
468	N G S A A M C H F T	5
521	E A G N T L V R N E	5
526	L V R N E S H K N C	5
527	V R N E S H K N C D	5

532	H K N C D F R V K D	5
551	K A Y F H N G D Y P	5
566	L H H S T S Y N S K	5
645	A D E G R L F L A E	5
678	K N R Y V D I L P Y	5
707	N A S Y I D G F K E	5
709	S Y I D G F K E P R	5
730	T V D D F W R M I W	5
735	W R M I W E Q K A T	5
759	K C A E Y W P S M E	5
761	A E Y W P S M E E G	5
762	E Y W P S M E E G T	5
809	V T H I Q F T S W P	5
814	F T S W P D H G V P	5
815	T S W P D H G V P E	5
835	R V N A F S N F F S	5
961	G N Q E E N K S K N	5
968	S K N R N S N V I P	5
969	K N R N S N V I P Y	5
993	K E S E H D S D E S	5
995	S E H D S D E S S D	5
1002	S S D D D S D S E E	5
1003	S D D D S D S E E P	5
1018	A S F I M S Y W K P	5
1059	L T E L K H G D Q E	5
1069	I C A Q Y W G E G K	5
1070	C A Q Y W G E G K Q	5
1072	Q Y W G E G K Q T Y	5
1080	T Y G D I E V D L K	5
1081	Y G D I E V D L K D	5
1089	K D T D K S S T Y T	5
1093	K S S T Y T L R V F	5
1102	F E L R H S K R K D	5
1109	R K D S R T V Y Q Y	5
1112	S R T V Y Q Y Q Y T	5
1114	T V Y Q Y Q Y T N W	5
1124	S V E Q L P A E P K	5
1173	Q T G I F C A L L N	5
1209	M V S T F E Q Y Q F	5
1215	Q Y Q F L Y D V I A	5
1233	Q V K K N N H Q E D	5

1248	N E V D K V K Q D A	5
1265	A P E K L P E A K E	5
1267	E K L P E A K E Q A	5
1269	L P E A K E Q A E G	5
1273	K E Q A E G S E P T	5
1286	E G P E H S V N G P	5
1292	V N G P A S P A L N	5
19	V F V T G Q S P T P	4
22	T G Q S P T P S P T	4
46	D P L P T H T T A F	4
83	V S P D S L D N A S	4
86	D S L D N A S A F N	4
115	T P S A G T D T Q T	4
118	A G T D T Q T F S G	4
124	T F S G S A A N A K	4
127	G S A A N A K L N P	4
130	A N A K L N P T P G	4
139	G S N A I S D V P G	4
165	T T T L S L A H H S	4
183	S N T T I T A N T S	4
191	T S D A Y L N A S E	4
196	L N A S E T T T L S	4
199	S E T T T L S P S G	4
204	L S P S G S A V I S	4
219	T T P S K P T C D E	4
235	V D Y L Y N K E T K	4
269	H N L T E C K N A S	4
281	I S H N S C T A P D	4
282	S H N S C T A P D K	4
296	D V P P G V E K F Q	4
308	D C T Q V E K A D T	4
313	E K A D T T I C L K	4
315	A D T T I C L K W K	4
316	D T T I C L K W K N	4
328	T F T C D T Q N I T	4
330	T C D T Q N I T Y R	4
342	C G N M I F D N K E	4
372	N N H K F T N A S K	4
378	N A S K I I K T D F	4
383	I K T D F G S P G E	4
396	I F C R S E A A H Q	4

403	A H Q G V I T W N P	4
437	K N L I K Y D L Q N	4
441	K Y D L Q N L K P Y	4
486	V W N M T V S M T S	4
489	M T V S M T S D N S	4
494	T S D N S M H V K C	4
503	C R P P R D R N G P	4
552	A Y F H N G D Y P G	4
553	Y F H N G D Y P G E	4
597	Y K I Y D L H K K R	4
599	I Y D L H K K R S C	4
600	Y D L H K K R S C N	4
614	Q E L V E R D D E K	4
623	K Q L M N V E P I H	4
629	E P I H A D I L L E	4
632	H A D I L L E T Y K	4
650	L F L A E F Q S I P	4
668	K E A R K P F N Q N	4
682	V D I L P Y D Y N R	4
694	L S E I N G D A G S	4
703	S N Y I N A S Y I D	4
706	I N A S Y I D G F K	4
708	A S Y I D G F K E P	4
719	K Y I A A Q G P R D	4
723	A Q G P R D E T V D	4
751	R C E E G N R N K C	4
752	C E E G N R N K C A	4
760	C A E Y W P S M E E	4
763	Y W P S M E E G T R	4
764	W P S M E E G T R A	4
801	K E K A T G R E V T	4
832	L R R R V N A F S N	4
836	V N A F S N F F S G	4
845	G P I V V H C S A G	4
860	T Y I G I D A M L E	4
888	R Q R C L M V Q V E	4
908	V E Y N Q F G E T E	4
947	Q R L P S Y R S W R	4
958	Q H I G N Q E E N K	4
960	I G N Q E E N K S K	4
1016	I N A S F I M S Y W	4

1017	N A S F I M S Y W K	4
1033	A Q G P L K E T I G	4
1038	K E T I G D F W Q M	4
1073	Y W G E G K Q T Y G	4
1086	V D L K D T D K S S	4
1088	L K D T D K S S T Y	4
1099	L R V F E L R H S K	4
1104	L R H S K R K D S R	4
1105	R H S K R K D S R T	4
1125	V E Q L P A E P K E	4
1148	Q K N S S E G N K H	4
1157	H H K S T P L L I H	4
1158	H K S T P L L I H C	4
1191	E V V D I F Q V V K	4
1197	Q V V K A L R K A R	4
1205	A R P G M V S T F E	4
1229	A Q N G Q V K K N N	4
1252	K V K Q D A N C V N	4
1253	V K Q D A N C V N P	4
1271	E A K E Q A E G S E	4
1274	E Q A E G S E P T S	4
1278	G S E P T S G T E G	4
1285	T E G P E H S V N G	4
1287	G P E H S V N G P A	4
1290	H S V N G P A S P A	4
1295	P A S P A L N Q G S	4
48	L P T H T T A F S P	3
67	F S E T T T S L S P	3
89	D N A S A F N T T G	3
91	A S A F N T T G V S	3
105	P H L P T H A D S Q	3
107	L P T H A D S Q T P	3
116	P S A G T D T Q T F	3
135	N P T P G S N A I S	3
160	P V S P L T T T L S	3
212	I S T T T I A T T P	3
245	L F T A K L N V N E	3
267	E V H N L T E C K N	3
274	C K N A S V S I S H	3
301	V E K F Q L H D C T	3
304	F Q L H D C T Q V E	3

311	Q V E K A D T T I C	3
332	D T Q N I T Y R F Q	3
338	Y R F Q C G N M I F	3
357	L E P E H E Y K C D	3
365	C D S E I L Y N N H	3
385	T D F G S P G E P Q	3
388	G S P G E P Q I I F	3
409	T W N P P Q R S F H	3
418	H N F T L C Y I K E	3
429	E K D C L N L D K N	3
447	L K P Y T K Y V L S	3
465	V Q R N G S A A M C	3
466	Q R N G S A A M C H	3
474	C H F T T K S A P P	3
487	W N M T V S M T S D	3
500	H V K C R P P R D R	3
502	K C R P P R D R N G	3
514	E R Y H L E V E A G	3
515	R Y H L E V E A G N	3
536	D F R V K D L Q Y S	3
542	L Q Y S T D Y T F K	3
560	P G E P F I L H H S	3
573	N S K A L I A F L A	3
611	D E Q Q E L V E R D	3
640	Y K R K I A D E G R	3
653	A E F Q S I P R V F	3
664	K F P I K E A R K P	3
672	K P F N Q N K N R Y	3
711	I D G F K E P R K Y	3
748	M V T R C E E G N R	3
776	D V V V K I N Q H K	3
778	V V K I N Q H K R C	3
779	V K I N Q H K R C P	3
781	I N Q H K R C P D Y	3
793	Q K L N I V N K K E	3
802	E K A T G R E V T H	3
812	I Q F T S W P D H G	3
826	P H L L L K L R R R	3
903	I H Q A L V E Y N Q	3
904	H Q A L V E Y N Q F	3
913	F G E T E V N L S E	3

923	L H P Y L H N M K K	3
927	L H N M K K R D P P	3
936	P S E P S P L E A E	3
944	A E F Q R L P S Y R	3
946	F Q R L P S Y R S W	3
949	L P S Y R S W R T Q	3
952	Y R S W R T Q H I G	3
973	S N V I P Y D Y N R	3
979	D Y N R V P L K H E	3
989	L E M S K E S E H D	3
991	M S K E S E H D S D	3
999	S D E S S D D D S D	3
1005	D D S D S E E P S K	3
1010	E E P S K Y I N A S	3
1012	P S K Y I N A S F I	3
1014	K Y I N A S F I M S	3
1019	S F I M S Y W K P E	3
1065	G D Q E I C A Q Y W	3
1067	Q E I C A Q Y W G E	3
1074	W G E G K Q T Y G D	3
1078	K Q T Y G D I E V D	3
1084	I E V D L K D T D K	3
1085	E V D L K D T D K S	3
1108	K R K D S R T V Y Q	3
1139	I Q V V K Q K L P Q	3
1143	K Q K L P Q K N S S	3
1146	L P Q K N S S E G N	3
1150	N S S E G N K H H K	3
1166	H C R D G S Q Q T G	3
1176	I F C A L L N L L E	3
1185	E S A E T E E V V D	3
1195	I F Q V V K A L R K	3
1199	V K A L R K A R P G	3
1242	D K I E F D N E V D	3
1255	Q D A N C V N P L G	3
1261	N P L G A P E K L P	3
1272	A K E Q A E G S E P	3
1279	S E P T S G T E G P	3
11	G F A P L D T E V F	2
16	D T E V F V T G Q S	2
31	T G L T T A K M P S	2

62	E R E N D F S E T T	2
75	S P D N T S T Q V S	2
76	P D N T S T Q V S P	2
77	D N T S T Q V S P D	2
99	V S S V Q T P H L P	2
104	T P H L P T H A D S	2
150	R S T A S T F P T D	2
220	T P S K P T C D E K	2
223	K P T C D E K Y A N	2
254	E N V E C G N N T C	2
258	C G N N T C T N N E	2
322	K W K N I E T F T C	2
334	Q N I T Y R F Q C G	2
390	P G E P Q I I F C R	2
397	F C R S E A A H Q G	2
410	W N P P Q R S F H N	2
412	P P Q R S F H N F T	2
415	R S F H N F T L C Y	2
417	F H N F T L C Y I K	2
457	L H A Y I I A K V Q	2
491	V S M T S D N S M H	2
508	D R N G P H E R Y H	2
523	G N T L V R N E S H	2
535	C D F R V K D L Q Y	2
544	Y S T D Y T F K A Y	2
546	T D Y T F K A Y F H	2
550	F K A Y F H N G D Y	2
602	L H K K R S C N L D	2
621	D E K Q L M N V E P	2
642	R K I A D E G R L F	2
648	G R L F L A E F Q S	2
665	F P I K E A R K P F	2
674	F N Q N K N R Y V D	2
680	R Y V D I L P Y D Y	2
689	Y N R V E L S E I N	2
690	N R V E L S E I N G	2
704	N Y I N A S Y I D G	2
724	Q G P R D E T V D D	2
728	D E T V D D F W R M	2
750	T R C E E G N R N K	2
754	E G N R N K C A E Y	2

756	N R N K C A E Y W P	2
767	M E E G T R A F G D	2
805	T G R E V T H I Q F	2
807	R E V T H I Q F T S	2
808	E V T H I Q F T S W	2
810	T H I Q F T S W P D	2
850	H C S A G V G R T G	2
872	E A E N K V D V Y G	2
920	L S E L H P Y L H N	2
924	H P Y L H N M K K R	2
928	H N M K K R D P P S	2
931	K K R D P P S E P S	2
953	R S W R T Q H I G N	2
957	T Q H I G N Q E E N	2
981	N R V P L K H E L E	2
1026	K P E V M I A A Q G	2
1064	H G D Q E I C A Q Y	2
1094	S S T Y T L R V F E	2
1107	S K R K D S R T V Y	2
1161	T P L L I H C R D G	2
1188	E T E E V V D I F Q	2
1206	R P G M V S T F E Q	2
1219	L Y D V I A S T Y P	2
1224	A S T Y P A Q N G Q	2
1232	G Q V K K N N H Q E	2
1237	N N H Q E D K I E F	2
1249	E V D K V K Q D A N	2
1250	V D K V K Q D A N C	2
1258	N C V N P L G A P E	2
17	T E V F V T G Q S P	1
50	T H T T A F S P A S	1
55	F S P A S T F E R E	1
57	P A S T F E R E N D	1
58	A S T F E R E N D F	1
60	T F E R E N D F S E	1
66	D F S E T T T S L S	1
69	E T T T S L S P D N	1
81	T Q V S P D S L D N	1
108	P T H A D S Q T P S	1
112	D S Q T P S A G T D	1
122	T Q T F S G S A A N	1

126	S G S A A N A K L N	1
148	G E R S T A S T F P	1
149	E R S T A S T F P T	1
153	A S T F P T D P V S	1
200	E T T T L S P S G S	1
227	D E K Y A N I T V D	1
323	W K N I E T F T C D	1
333	T Q N I T Y R F Q C	1
355	E N L E P E H E Y K	1
359	P E H E Y K C D S E	1
379	A S K I I K T D F G	1
391	G E P Q I I F C R S	1
404	H Q G V I T W N P P	1
405	Q G V I T W N P P Q	1
411	N P P Q R S F H N F	1
423	C Y I K E T E K D C	1
425	I K E T E K D C L N	1
428	T E K D C L N L D K	1
497	N S M H V K C R P P	1
499	M H V K C R P P R D	1
501	V K C R P P R D R N	1
510	N G P H E R Y H L E	1
519	E V E A G N T L V R	1
531	S H K N C D F R V K	1
539	V K D L Q Y S T D Y	1
549	T F K A Y F H N G D	1
555	H N G D Y P G E P F	1
558	D Y P G E P F I L H	1
563	P F I L H H S T S Y	1
605	K R S C N L D E Q Q	1
637	L E T Y K R K I A D	1
639	T Y K R K I A D E G	1
667	I K E A R K P F N Q	1
669	E A R K P F N Q N K	1
677	N K N R Y V D I L P	1
698	N G D A G S N Y I N	1
718	R K Y I A A Q G P R	1
755	G N R N K C A E Y W	1
765	P S M E E G T R A F	1
774	F G D V V V K I N Q	1
798	V N K K E K A T G R	1

799	N K K E K A T G R E	1
834	R R V N A F S N F F	1
879	V Y G Y V V K L R R	1
881	G Y V V K L R R Q R	1
910	Y N Q F G E T E V N	1
916	T E V N L S E L H P	1
930	M K K R D P P S E P	1
971	R N S N V I P Y D Y	1
972	N S N V I P Y D Y N	1
977	P Y D Y N R V P L K	1
986	K H E L E M S K E S	1
992	S K E S E H D S D E	1
997	H D S D E S S D D D	1
998	D S D E S S D D D S	1
1006	D S D S E E P S K Y	1
1008	D S E E P S K Y I N	1
1011	E P S K Y I N A S F	1
1034	Q G P L K E T I G D	1
1037	L K E T I G D F W Q	1
1041	I G D F W Q M I F Q	1
1110	K D S R T V Y Q Y Q	1
1115	V Y Q Y Q Y T N W S	1
1202	L R K A R P G M V S	1
1230	Q N G Q V K K N N H	1
1231	N G Q V K K N N H Q	1
1236	K N N H Q E D K I E	1
1247	D N E V D K V K Q D	1
1277	E G S E P T S G T E	1
1289	E H S V N G P A S P	1
1293	N G P A S P A L N Q	1
30	P T G L T T A K M P	0
38	M P S V P L S S D P	0
94	F N T T G V S S V Q	0
97	T G V S S V Q T P H	0
221	P S K P T C D E K Y	0
228	E K Y A N I T V D Y	0
240	N K E T K L F T A K	0
252	V N E N V E C G N N	0
266	N E V H N L T E C K	0
273	E C K N A S V S I S	0
289	P D K T L I L D V P	0

290	D K T L I L D V P P	0
299	P G V E K F Q L H D	0
302	E K F Q L H D C T Q	0
307	H D C T Q V E K A D	0
326	I E T F T C D T Q N	0
331	C D T Q N I T Y R F	0
339	R F Q C G N M I F D	0
341	Q C G N M I F D N K	0
349	N K E I K L E N L E	0
375	K F T N A S K I I K	0
436	D K N L I K Y D L Q	0
449	P Y T K Y V L S L H	0
467	R N G S A A M C H F	0
473	M C H F T T K S A P	0
475	H F T T K S A P P S	0
478	T K S A P P S Q V W	0
504	R P P R D R N G P H	0
506	P R D R N G P H E R	0
507	R D R N G P H E R Y	0
512	P H E R Y H L E V E	0
529	N E S H K N C D F R	0
562	E P F I L H H S T S	0
603	H K K R S C N L D E	0
606	R S C N L D E Q Q E	0
662	F S K F P I K E A R	0
686	P Y D Y N R V E L S	0
731	V D D F W R M I W E	0
733	D F W R M I W E Q K	0
784	H K R C P D Y I I Q	0
817	W P D H G V P E D P	0
824	E D P H L L L K L R	0
825	D P H L L L K L R R	0
833	R R R V N A F S N F	0
869	E G L E A E N K V D	0
915	E T E V N L S E L H	0
934	D P P S E P S P L E	0
955	W R T Q H I G N Q E	0
962	N Q E E N K S K N R	0
963	Q E E N K S K N R N	0
1001	E S S D D D S D S E	0
1043	D F W Q M I F Q R K	0

1045	W Q M I F Q R K V K	0
1111	D S R T V Y Q Y Q Y	0
1142	V K Q K L P Q K N S	0
1149	K N S S E G N K H H	0
1153	E G N K H H K S T P	0
1168	R D G S Q Q T G I F	0
1212	T F E Q Y Q F L Y D	0
1226	T Y P A Q N G Q V K	0
1234	V K K N N H Q E D K	0
1239	H Q E D K I E F D N	0
1240	Q E D K I E F D N E	0
1270	P E A K E Q A E G S	0
1282	T S G T E G P E H S	0
242	E T K L F T A K L N	-1
260	N N T C T N N E V H	-1
366	D S E I L Y N N H K	-1
392	E P Q I I F C R S E	-1
414	Q R S F H N F T L C	-1
496	D N S M H V K C R P	-1
505	P P R D R N G P H E	-1
528	R N E S H K N C D F	-1
534	N C D F R V K D L Q	-1
612	E Q Q E L V E R D D	-1
613	Q Q E L V E R D D E	-1
618	E R D D E K Q L M N	-1
620	D D E K Q L M N V E	-1
654	E F Q S I P R V F S	-1
716	E P R K Y I A A Q G	-1
726	P R D E T V D D F W	-1
727	R D E T V D D F W R	-1
757	R N K C A E Y W P S	-1
818	P D H G V P E D P H	-1
938	E P S P L E A E F Q	-1
965	E N K S K N R N S N	-1
1000	D E S S D D D S D S	-1
1004	D D D S D S E E P S	-1
1066	D Q E I C A Q Y W G	-1
1091	T D K S S T Y T L R	-1
1096	T Y T L R V F E L R	-1
1101	V F E L R H S K R K	-1
1117	Q Y Q Y T N W S V E	-1

1169	D G S Q Q T G I F C	-1
1288	P E H S V N G P A S	-1
28	P S P T G L T T A K	-2
64	E N D F S E T T T S	-2
85	P D S L D N A S A F	-2
147	P G E R S T A S T F	-2
671	R K P F N Q N K N R	-2
753	E E G N R N K C A E	-2
787	C P D Y I I Q K L N	-2
925	P Y L H N M K K R D	-2
945	E F Q R L P S Y R S	-2
950	P S Y R S W R T Q H	-2
964	E E N K S K N R N S	-2
994	E S E H D S D E S S	-2
1027	P E V M I A A Q G P	-2
1131	E P K E L I S M I Q	-2
1207	P G M V S T F E Q Y	-2
138	P G S N A I S D V P	-3
257	E C G N N T C T N N	-3
298	P P G V E K F Q L H	-3
483	P S Q V W N M T V S	-3
547	D Y T F K A Y F H N	-3
647	E G R L F L A E F Q	-3
659	P R V F S K F P I K	-3
939	P S P L E A E F Q R	-3
996	E H D S D E S S D D	-3
1266	P E K L P E A K E Q	-3
358	E P E H E Y K C D S	-4
362	E Y K C D S E I L Y	-4
717	P R K Y I A A Q G P	-4
1076	E G K Q T Y G D I E	-4
1147	P Q K N S S E G N K	-4
1245	E F D N E V D K V K	-4
1280	E P T S G T E G P E	-4